Landforms and Oceans

5.3 The student will demonstrate an understanding of features, processes, and changes in Earth's land and oceans. (Earth Science)

5-3.2 Illustrate the geologic landforms of the ocean floor (including the continental shelf and slope, the mid-ocean ridge, rift zone, trench, and the ocean basin).
Taxonomy level: 2.2-B Understand Conceptual Knowledge

Previous/Future knowledge: In 3rd grade (3-3.6), students illustrated Earth's land features, including volcanoes, mountains, valleys, canyons, caverns, and islands). The concept of the geologic landforms of the ocean floor is new content for this grade. This concept will be further studied in high school Earth Science.

It is essential for students to know that the ocean floor contains geologic structures. These features can be illustrated using words descriptions, pictures, or diagrams. These landforms include:

Continental shelf
- The edges of the continents slope down from the shore into the ocean.
- The part of the continent located under the water is known as the *continental shelf*.
- The width of the continental shelf varies around the edges of the continents.
- In some places the continental shelf is fairly shallow and in other place it becomes very deep, but it is not the deepest part of the ocean.

Continental slope
- The steep slope where the continental shelf drops to the bottom of the ocean floor is called the *continental slope*.
- The depth of the ocean water increases greatly here.

Mid-ocean ridge
- On the bottom of the ocean, there is a central ridge, or mountain range, that divides the ocean floor into two parts.
- These underwater volcanic mountains are known as the *mid-ocean ridge*.
- Volcanic mountains not formed on the mid-ocean ridge are called *seamounts*.

Rift zone
- In the center of the highest part of the mid-ocean ridge is a narrow trench called a *rift*.
- Underwater volcanic activity that adds mountains to either side of the mid-ocean ridge occurs at the *rift zone*.

Trenches
- There are many steep-sided canyons and deep, narrow valleys in the bottom of the ocean.
- Ocean *trenches* are the deepest part of the ocean basin and are deeper than any valley found on land.

Ocean basin
- Located on either side of the mid-ocean ridge is the *ocean basin*.
- It is made up of low hills and flat plains.
- The flat area of the ocean basin is called the *abyssal plain*. Seamounts are generally formed on the ocean basin.

Landforms and Oceans

5.3 The student will demonstrate an understanding of features, processes, and changes in Earth's land and oceans. (Earth Science)

It is not essential for students to know about ocean floor spreading; continental plates and boundaries; or deep-ocean exploration efforts. Deep ocean-mapping methods are not necessary, but in discussion or activity it may give the students a better idea of how scientists learned about the features on the ocean floor.

Assessment Guidelines:
The objective of this indicator is to *illustrate* geologic landforms of the ocean floor; therefore, the primary focus of assessment should be to give or use illustrations to show aspects of these features (including the continental shelf and slope, the mid-ocean ridge, rift zone, trench, and the ocean basin). However, appropriate assessments should also require students to *recall* information about each landform region of the ocean floor; or *interpret* a diagram showing the ocean floor regions.